AHPA Almond Hull Task Force Update

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Task Force Established to Review Almond Hull/Standards

- Established August 2013
- Task Force consists of all stakeholders
  - Animal Nutritionists
  - Merchandisers/Brokers
  - Huller/Shellers
  - CDFA
  - CGFA
  - Members of the Feed Inspection Advisory Board
  - IEH-JL Analytical Laboratory

August 2013 Meeting

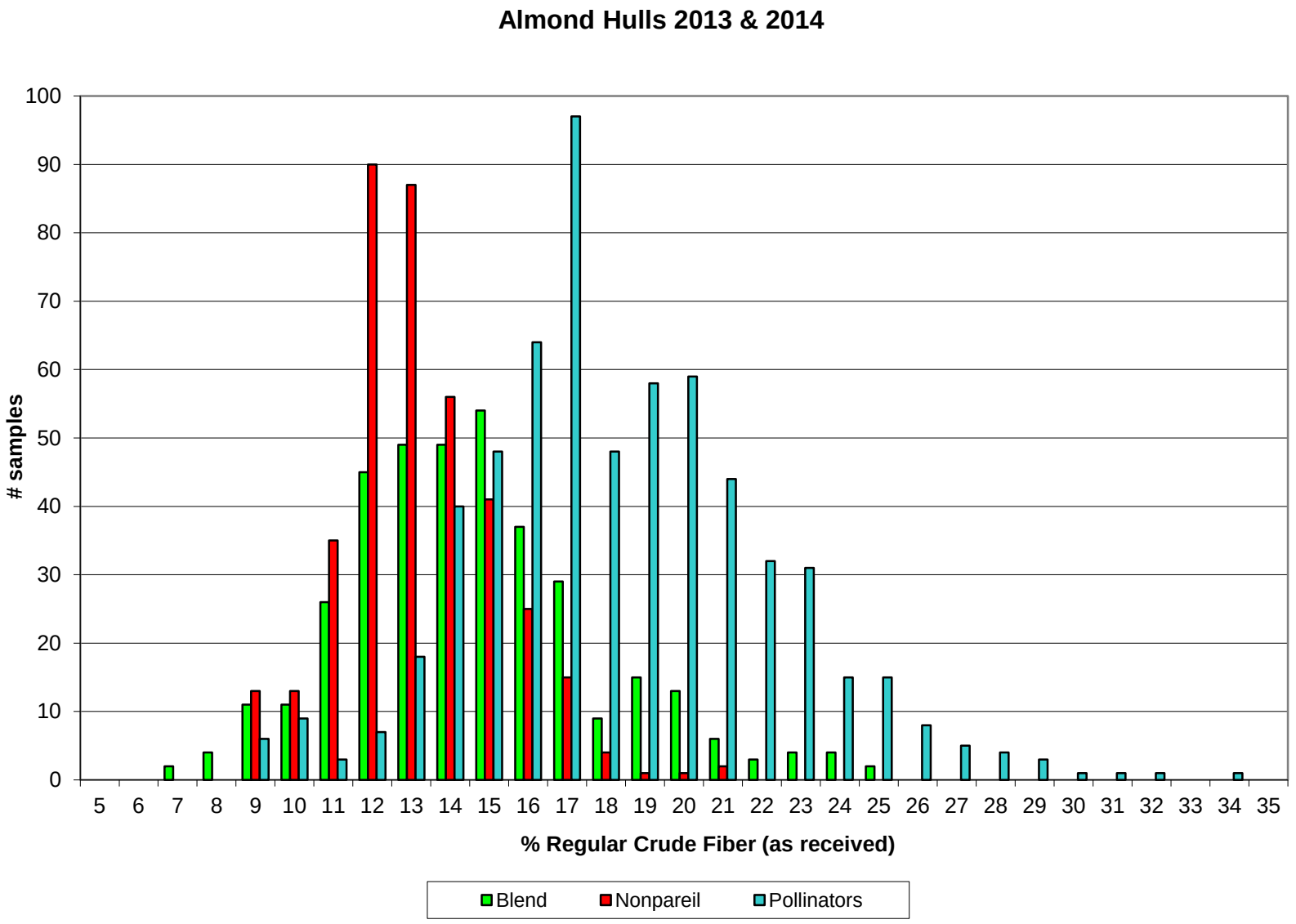
- General Conclusions
  - Crude Fiber (CF) is not the best indicator of nutritional value of hulls
    - Acid Detergent Fiber (ADF) is best indicator of value
    - Very few commodities are regulated on CF; industry moving away from CF completely
  - A standardized, multi-tiered tiered program would benefit all stakeholders
  - Need data on current varieties
    - Data available is from the 1970's and early 1980's
  - All aspects of the current label/guarantee should be reviewed

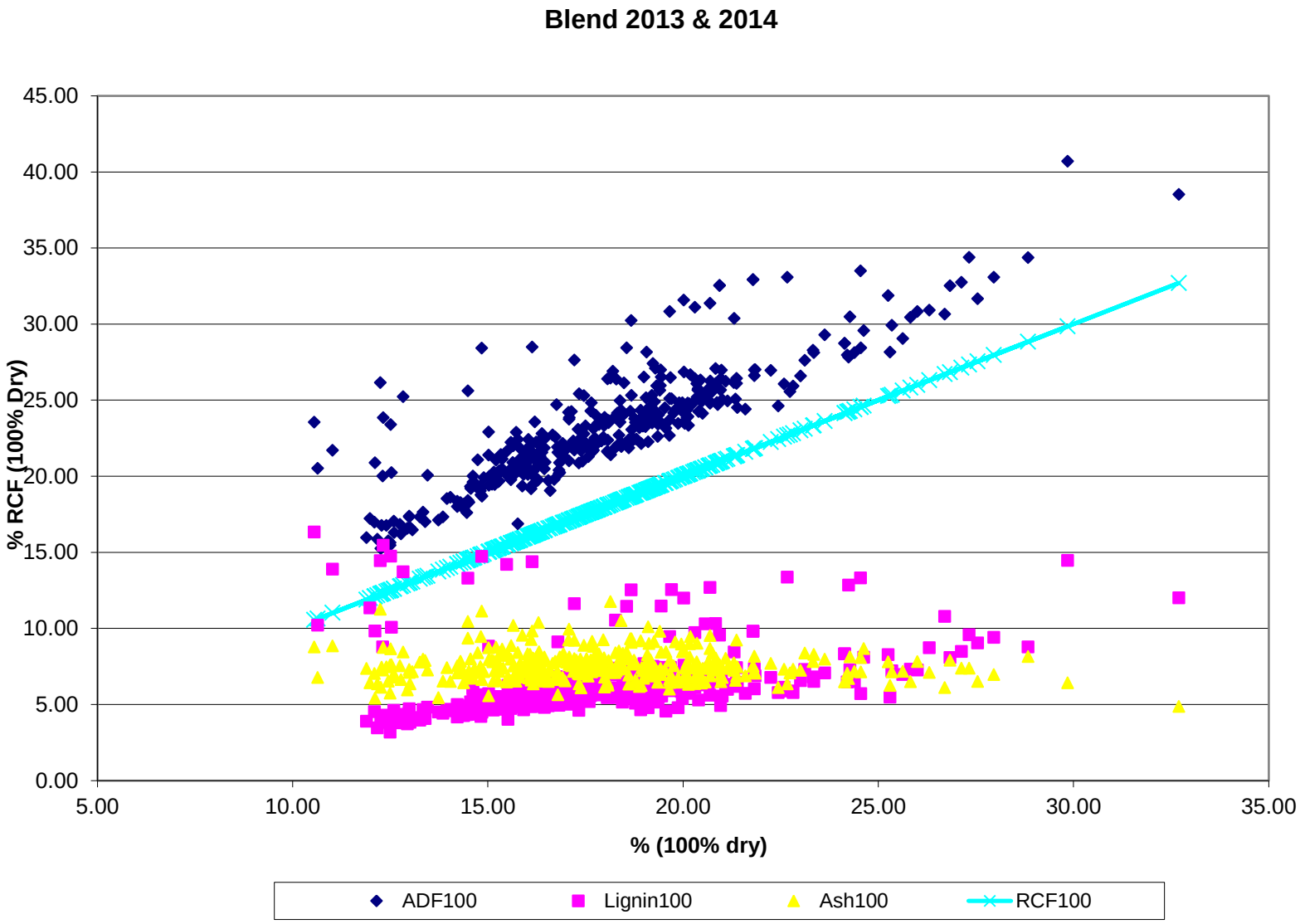
2013 Voluntary Samples – Not Enough Submissions

- Total goal = 1,000+
- AHPA Members began contributing Samples with additional analysis
  - Crude Fiber (CF), Ash, Moisture, Acid Detergent Fiber (ADF) and Lignin
- **333** Samples received for 2013
- Continued collecting samples for the 2014 season

Voluntary Samples 2013-2014

Sample Type	# of samples
IEH -Wet Chem AHPA Almond Hull Package	378
IEH – NIR AHPA Almond Hull Package (Dec 2013)	1087
Total IEH AHPA Almond Hull Package	**1465**
Non AHPA Almond Hull Fiber Analysis	2380
TOTAL IEH Almond Hull Fiber Analysis	**3845**
Analytical Feed	118
Denele	103
Siliker	6
AL Western	3
Total Almond Hull Package All Labs	**1695**


Almond Hulls 2013 & 2014
samples
0
10
20
30
40
50
60
70
80
90
100
5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35
% Regular Crude Fiber (as received)
Blend
Nonpareil
Pollinators


Blend 2013 & 2014
% RCF (100% Dry)
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
% (100% dry)
ADF100
Lignin100
Ash100
RCF100

State vs. Independent Lab Concerns

- Variability is a significant concern
  - Could impact ability to be in compliance with almond hull regulations
  - Could impact accuracy of voluntary sample results being used for standards reform effort
- AHPA worked with CDFA to perform a split sample survey where 50 official samples collected by CDFA were sent to 4 independent labs
  - State Lab = Center for Analytical Chemistry (CAC)

Conclusions of Split Sample Study

- State lab did not identify any significant trends or anomalies other than there is variance
- Crude Fiber and Ash had least variance
  - Labs will need to get up to speed on analysis for new standard(s)
- State lab has offered to host a lab day to discuss methodologies
- The purple lab's results will be withdrawn from the sample set
  - not many results submitted from that lab

CDFA Split Sample Survey

Negative means Independent result is higher than State

Lab	Almond Hull Split Sample Study Results Average Difference CAC Minus Independent Lab (N=50)	Dry Matter	Moisture (Vacuum Oven)	Acid Degergent Fiber	Acid Detergent Lignin	Regular Crude Fiber	Ash
Red	Average Differences All Samples (CAC minus Lab)	-1.98%	2.00%	-0.91%	0.70%	-1.37%	-0.62%
Purple	Average Differences All Samples (CAC minus Lab)	-4.89%	4.89%	-5.16%	-4.07%	-1.92%	-1.74%
Yellow	Average Differences All Samples (CAC minus Lab)	-0.39%	0.39%	1.70%	4.15%	-1.49%	-0.67%
Green	Average Differences All Samples (CAC minus Lab)	1.33%	-1.33%	-0.03%	0.90%	0.66%	-1.14%

Figure 5: Data Projection of % Crude Fiber

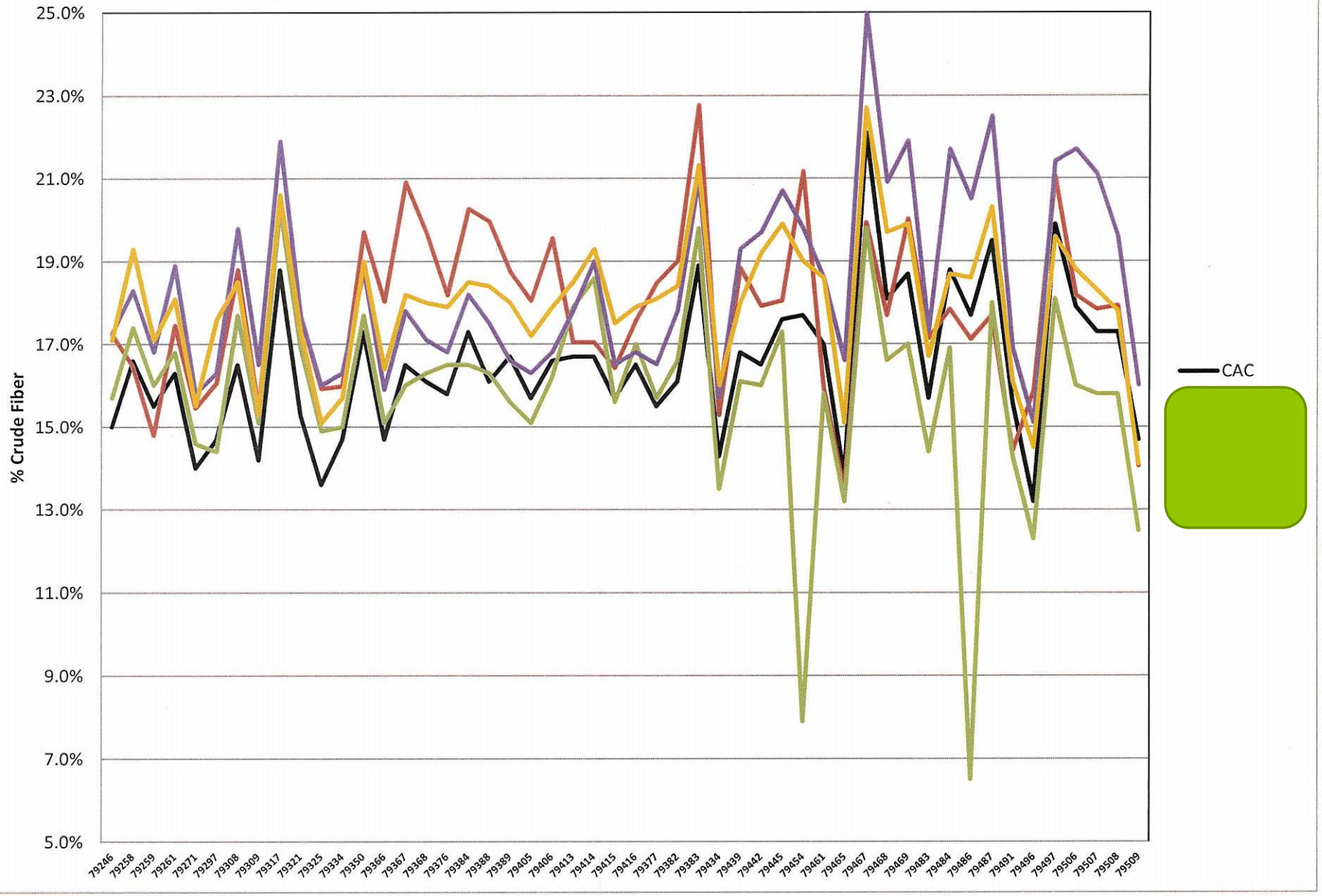


Figure 2: Data Projection of % moisture
Vacuum Oven

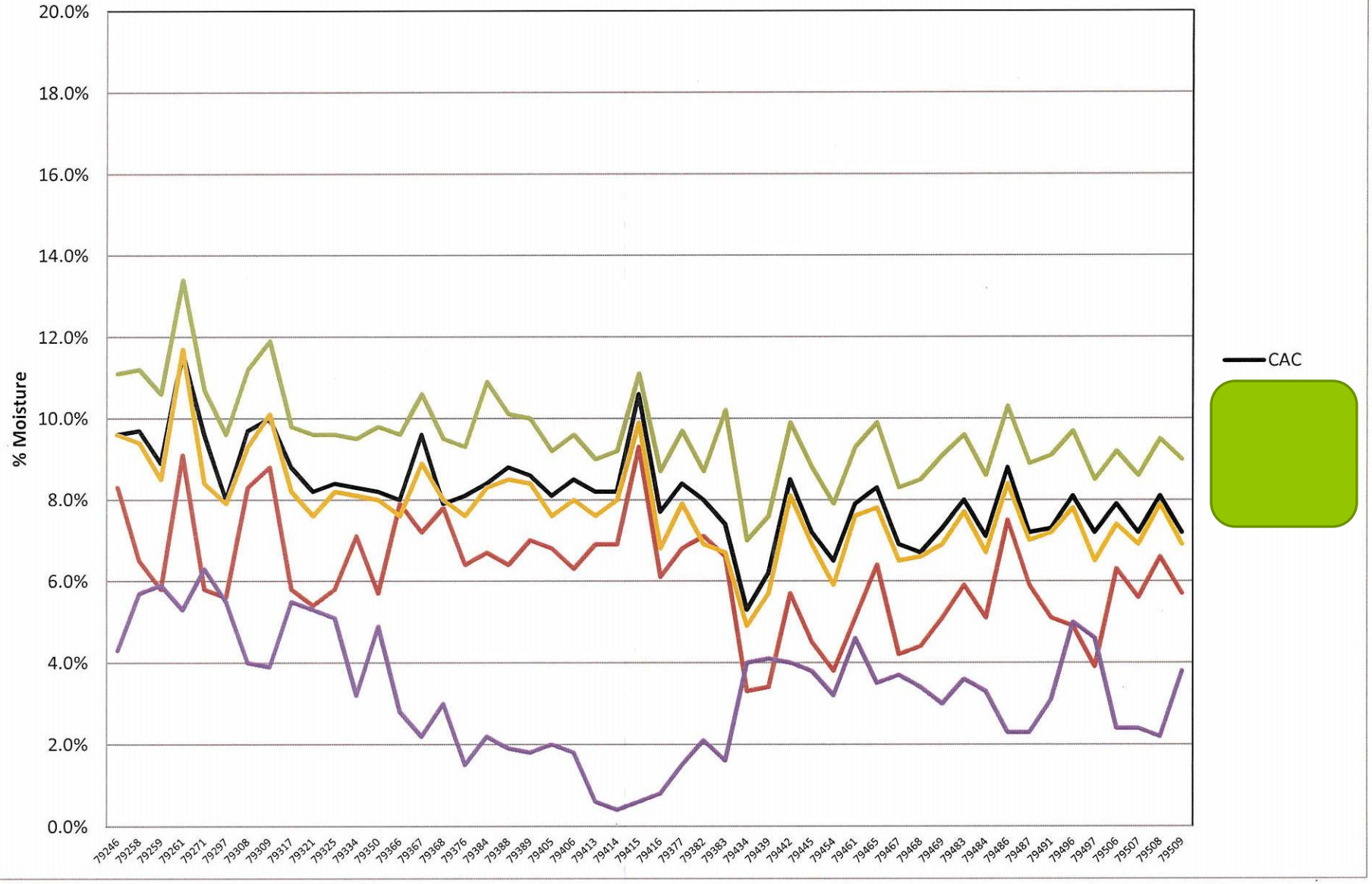


Figure 6: Data projection of % Ash

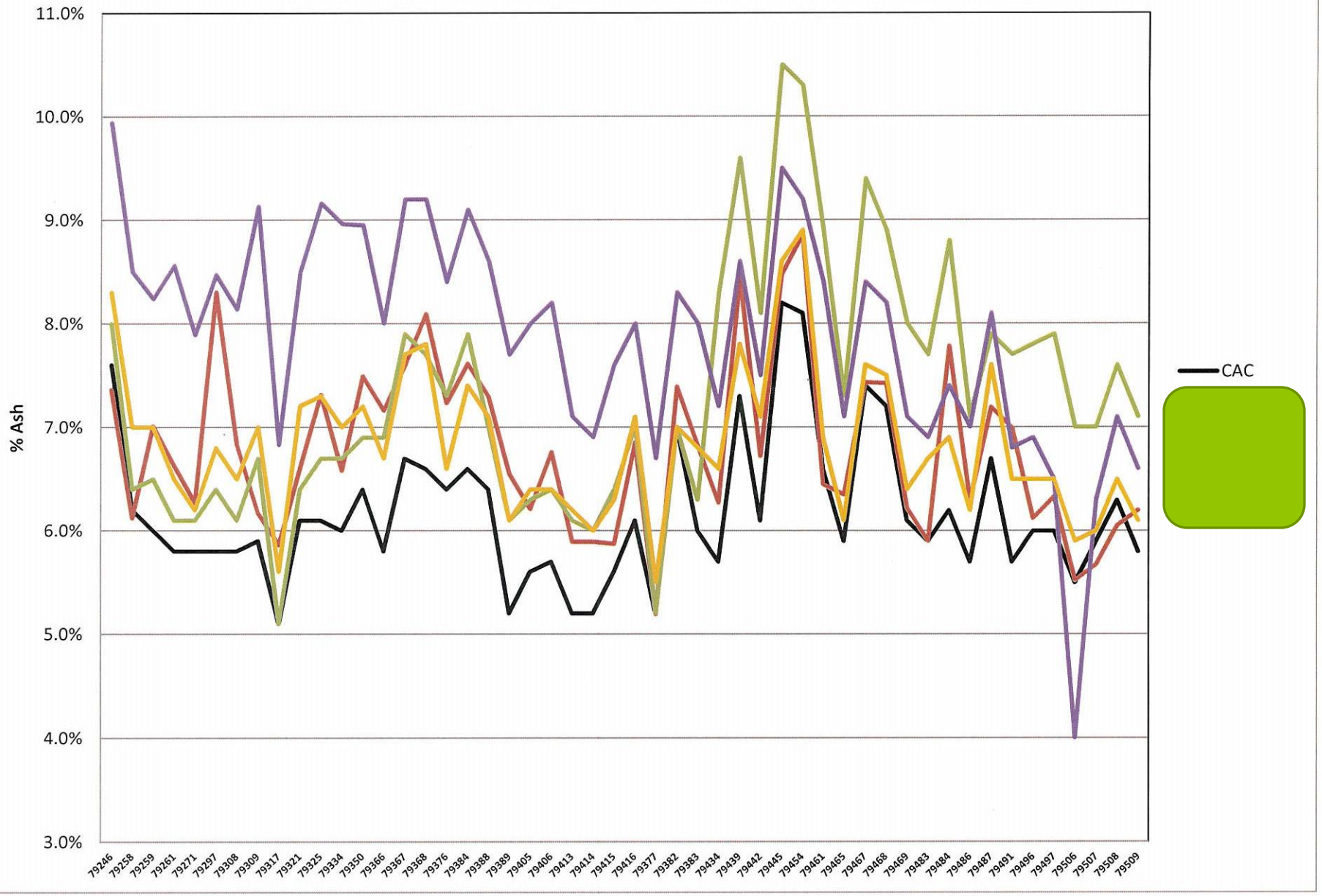


Figure 3: Data projection of Acid Detergent Fiber

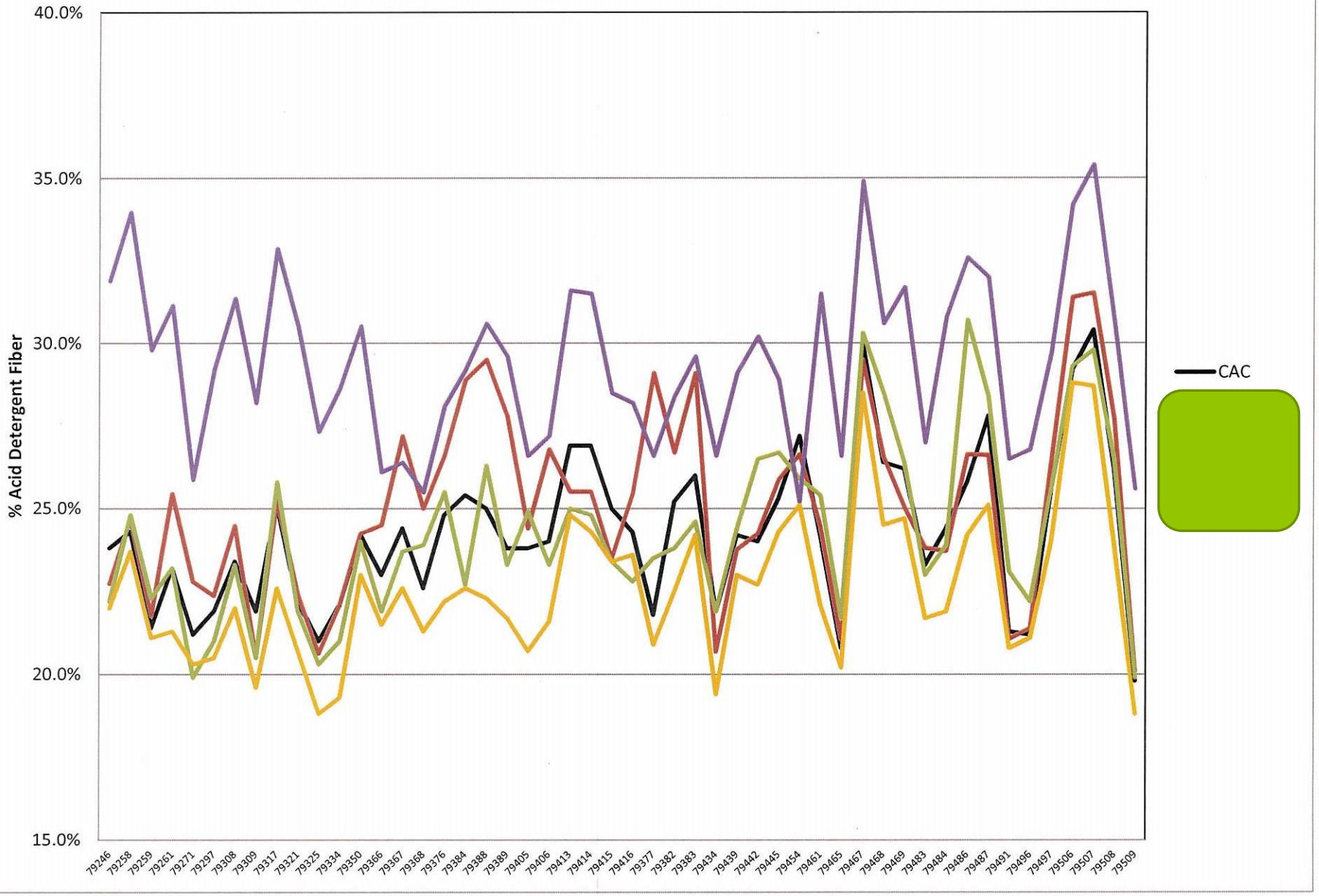
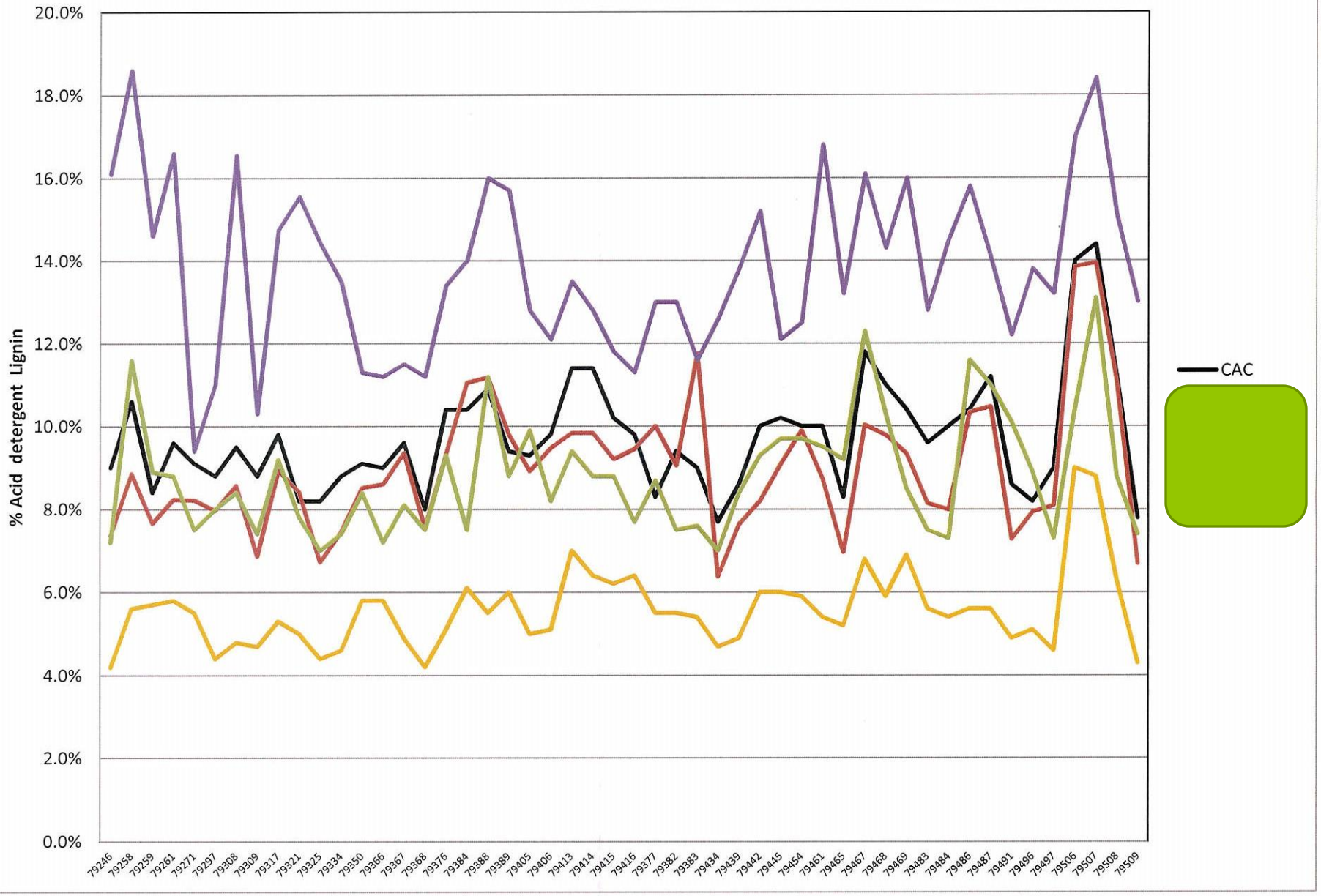


Figure 4: Data Projection of Acid Detergent Lignin



Hull Task Force Meeting Feb. 24th

- Reviewed hull split data and 2013-2014 voluntary sample data
- Tad Bell, Velo Consulting, did a deep dive into almond hull history
  - Looked at past research conducted on hulls; ADF best indicator of value of almond hulls
  - Very limited research; small sample sizes; irrelevant varieties
- Working with Cal Poly on digestibility study of hulls at varying levels of fiber
  - Identify where significant changes in nutritional/energy levels of hulls exist
  - Will assist in determining ranges of tiers

Digestibility Samples

		Listed By Sample Number	DM	Moisture	ADF	Ash	RCF	Lignin
1	341911-01	Nonpareil 100%	94.5	5.5	18.2	6.5	14.6	4.6
2	342245-02	Cal 100%	88.7	11.3	21.4	7.2	18.5	4.9
3	341911-03	Hardshell 100%	92.2	7.9	28.8	5.5	26.1	6.4
4	341911-04	Butte/Padre 100%	91.4	8.6	20.2	6.2	18.5	4.6
5	341911-05	Nonpareil 50%, Cal 50%	92	8	18.6	6.5	15.3	4.6
6	341911-06	Nonpareil 66%, Cal 34%	92.6	7.4	20.8	6.5	17.3	5.3
7	341911-07	Cal 66%, Hardshell 34%	91.3	8.7	25.1	5.9	22.3	5.5
8	341911-08	Butte/Padre 50%, Hardshell 50%	87.7	12.3	24.6	5.2	22.2	5.7
9	341911-09	Butte/Padre 66%, Hardshell 34%	88.3	11.7	23.8	5.5	21.8	5.4
10	341911-10	Cal 50%, Butte/Padre 50%	88.6	11.4	21.1	6.2	18.5	4.8
11	341911-11	Cal 50%, Butte/Padre 25%, Hardshell 25%	90.5	9.5	27.9	5.1	25.1	6.1
12	342245-05	Nonpareil (Clean)	89.6	10.4	13.2	6.6	10.9	3.5

July 30th Hull Task Force Meeting

- Review Digestibility Study Results
  - 4 time points and replicated it with two animals per sample
  - Total of 96 almond hull samples included
  - 8 control samples using soy hulls
- Determine Next Steps
  - Optimistic we can start the process to update the regulatory standards based on science
  - Outreach and communications to the dairy industry on our efforts, research, and benefits of a new standard